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Thomas Fischer

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EXAMINER

TADAYYON ESLAMI, TABASSOM

ART UNIT

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1792

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,647	Applicant(s) FISCHER, THOMAS	
	Examiner TABASSOM TADAYYON ESLAMI	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 11-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/29/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim interpretation

Claims 11-13 are interpreted under 35 USC 112, 6th paragraph to cover the corresponding structure. Based on the disclosure at, 17th full paragraph, the term "means for producing a homogenous surface tension" of the claim 11 has been interpreted as a means for corona treatment. Based on the disclosure at 18th and 20th full paragraph the term "means for reducing the surface tension of the substrate in the first or second region to a lower value" interprets as a roller with uneven surface. Based on the disclosure at 22nd 23rd, 24th and 25th full paragraph the term "means for application of the functional material to the substrate" interpret as a spray nozzle, fluid jet projector or dipping bath.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1- 3, 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable by J. Devin MacKenzi (U. S. Patent: 7276385, here after 385), further in view of George Roland Hill et al (U. S Patent Application: 2004/0045931, here after Hill).

Claim 1 is rejected. 385 teaches,

Method of producing structures (pattern) from electrical functional materials [abstract lines 3-6], in which in a first method step the substrate is pretreated in such a way that at least a first (between the pattern, where it needs the repair) and a second region (within the pattern) are formed with different surface tensions [column 23 lines 45-55], the first region being configured in the shape of the structure to be produced (repaired area), and in a second method step the functional material is applied to the substrate, the functional material being configured so that it is deposited only in the first region (repaired area) and thus the desired structure is formed from functional material [column 23 lines 53-59]. He further teaches in a first method step first of all high surface tension of the substrate is produced [column 23 lines 47] and then the surface tension of the substrate is reduced to a lower value in the first or second area [column 23 lines 48-52]. He does not specifically teach treating the surface to increase the surface tension homogeneously which is higher relative to the normal state of the substrate. Hill teaches a method of producing structures (pattern) from functional materials (ink) [0002, 0006 lines 4-8], in which in the surface of the substrate is treated so different areas with different surface energy appears on the surface [0058, abstract last 3 lines] and depositing the functional materials, thus the desired structure is formed from functional material [0059 lines 8-17]. He further teaches the first method step first of all a homogeneous surface tension of the substrate is produced which is higher relative to the normal state of the substrate and then the surface tension of the substrate is reduced to a lower value in the first or second region [0025, 0026, 0031]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was

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made to produce a structure of functional material with the method that 385 teaches, where the surface is treated homogeneously to get higher surface energy as Hill teaches, because Hill teaches it is suitable to deposit the electrical functional material on a patterned surface where the surface is treated so the surface energy is higher with respect to the normal status.

Claim 2 is rejected. 385 and Hill teach the limitation of claim 1 as discussed above and Hill further teaches the production of the homogeneous surface tension takes place by a corona treatment [0023 lines 1-7, 0049]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure of functional material with the method that 385 teaches, where the surface is treated homogeneously with corona discharge as Hill teaches, because Hill teaches it is appropriate to use corona discharge to increase surface energy of a substrate uniformly.

Claim 3 is rejected. 385 and Hill teach the limitation of claim 1 as discussed above and the production of the homogeneous surface tension takes place by homogeneous surface tension takes place by a corona treatment [0023 lines 1-7, 0049]. Hill further teaches the corona treatment cause the atmospheric oxygen molecules break down and bond to molecules of the surface materials (chemically alter the surface), which can be considered as a chemical treatment because it chemically alliterate the surface of the substrate.

Claim 5 is rejected. 385 and Hill teach the limitation of claim 1 as discussed above. Hill and 385 teaches the increasing of surface tension via corona discharge is

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due to corona and chemical treatment. The corona discharge also will remove some part of the material mechanically due to the ion bombardment. It is prima facie obvious to combine two process each of which is taught by the prior art to be useful for the same purpose, in order to form a this process to be used for the very same purpose of increasing the surface energy [T]he idea of combining them flows logically from their having been individually taught in the prior art. *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069 1072. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure of functional material with the method that Hill teaches where the surface is treated by corona, chemical and mechanical treatment, because Corona discharge cause the surface to change chemically and mechanically.

Claim 8 is rejected. 385 and Hill teach the limitation of claim 1 and 385 further teaches in the second method step (depositing the functional material) the functional material is applied in a spraying process in which the substrate surface is sprayed with the functional material [column 5 lines 1-5], the functional material being deposited only in the region with suitable surface (higher) tension because of the different surface tensions [column 23 lines 55-, 64].

2. Claims 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over J. Devin MacKenzi (U. S. Patent: 7276385, here after 385), and George Roland Hill et al (U. S Patent Application: 2004/0045931, here after Hill) as applied to claim 1 above, further in view of A. Joy Michaelis (U. S. Patent: 5189437, here after 437).

Claim 4 is rejected. 385 and Hill teach the limitation of claim 1 as discussed above. They do not teach changes in the surface energy are due to mechanical treatment. 437 teaches a method of removing a surface (the material (particles) mechanically removes from the surface (like scratching) as the results of laser ablation) with a laser beam and he further teaches the laser beam makes the surface energy to increases by ablation (increasing the contact angle) and improve the adhesion of the ink (functional material) [column 3 lines 31-35]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure of functional material with the method that 385 teaches where the surface is treated by laser to increase the surface energy as the result of ablation, because 437 teaches it is appropriate to increase the surface energy by laser ablation.

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over J. Devin MacKenzi (U. S. Patent: 7276385, here after 385) and George Roland Hill et al (U. S Patent Application: 2004/0045931, here after Hill), further in view of Daido Komyoji et al (U. S. Patent Application: 2002/0050061, here after 061).

385 and Hill teach the limitation of claim 1 as discussed above. 385 teaches the patterned surface further comprises low surface energy and high surface energy areas [column 23 lines 45-50], where the functional materials deposited on the surface with high surface energy [column 23 lines 45-64]. Neither of them teaches the deposition of the functional particles is done with a roller. 061 teaches a method of forming a pattern structure [abstract lines 1-3] from the electrical functional materials to make circuit boards [0001]. He further teaches the applying of the particles to the surface is done via

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a roller [fig. 2]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure of functional material with the method that 385 teaches where the functional material is applied to the surface via a roller as 061 teaches, because 061 teaches it is appropriate to apply the functional material to form a patterned surface with a roller.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over J. Devin MacKenzi (U. S. Patent: 7276385, here after 385) and George Roland Hill et al (U. S Patent Application: 2004/0045931, as applied to claim 1 above, further in view of Philip G. Bentley et al (U. S. Patent Application: 2005/0130397, here after 397). 385 and Hill teach the limitation of claim 1 as discussed above. 385 teaches the patterned surface further comprises low surface energy and high surface energy areas [column 23 lines 45-50], where the functional materials deposited on the surface with high surface energy [column 23 lines 45-64]. Neither of them teaches the deposition of the functional particles is done by dipping process. 397 teaches a method of forming a pattern on a substrate such as printed circuit boards [0002 1-8]. He further discloses the pattern can be form by a functional liquid (liquid material containing functional material) and by dipping method [0004]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure of functional material with the method that 385 teaches where the functional material is applied to the surface via dipping as 397 teaches, because 397 teaches it is appropriate to apply the functional material to form a patterned surface with dipping it in a functional liquid.

4. Claims 6, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over J. Devin MacKenzi (U. S. Patent: 7276385, here after 385) and George Roland Hill et al (U. S Patent Application: 2004/0045931, here fatter Hill), further in view of Gerald M. Fletcher (U. S. Patent: 3981498, here after Fletcher).

385 and Hill teach the limitation of claim 1 as discussed above. They teach a method of forming a pattern of functional materials by depositing the functional materials on the patterned area with higher surface energy (positive charged). They do not teach the reduction of the surface tension takes place by contact with a contact structure. Fletcher teaches a method of forming pattered structure by creating charged pattern area on substrate by a textured roller [abstract lines 1-3]. He further teaches the roller with constant charge will apply the charge on the substrate where the features are in contact with the surface. Since the surface energy depended on surface charge, therefore if the charged roller is in opposite charge with the substrate, the surface tension reduces in areas that the roller features touched the substrate. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure that 385 teaches where the reduction in surface tension (neutralizing the localized charges) takes place with a roller having features with (opposite) charge, because Fletcher teaches it is appropriate to make a charged pattern on a substrate by a textured roller.

Claims 11-13 are rejected. 385 and Hill teach the limitation of claim 1 as discussed above. 385 teaches a means for applying functional material to the substrate (in form of liquid, spray) [column 24 lines 46-35]. He does not teach the means for

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creating a homogeneous surface tension of substrate higher than initial state of the substrate (corona discharge). Hill teaches a method of producing structures (pattern) from functional materials (ink) [0002, 0006 lines 4-8], in which in the surface of the substrate is treated so different areas with different surface energy appears on the surface [0058, abstract last 3 lines] and depositing the functional materials. He teaches a means for creating a homogeneous surface tension of substrate higher than initial state of the substrate (corona discharge) [0025, 0026, and 0031]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure that 385 teaches with creating a homogeneous surface tension of substrate higher than initial state of the substrate (corona discharge) as Hill teaches, because Hill teaches it is suitable to deposit the electrical functional material on a patterned surface where the surface is treated so the surface energy is higher with respect to the normal status. Neither of them teach a means for reducing the surface tension of the substrate in the first or second region to a lower value. Fletcher teaches a method of forming patterned structure by creating charged pattern area on substrate by a textured roller [abstract lines 1-3]. He further teaches the roller with constant charge will apply the charge on the substrate where the features are in contact with the surface. Since the surface energy depended on surface charge, therefore if the charged roller is in opposite charge with the substrate, the surface tension reduces in areas that the roller features touched the substrate. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure that 385 teaches where the reduction in surface tension (neutralizing the localized charges)

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takes place with a roller having features with (opposite) charge, because Fletcher teaches it is appropriate to make a charged pattern on a substrate by a textured roller.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over J. Devin MacKenzi (U. S. Patent: 7276385, here after 385) and George Roland Hill et al (U. S Patent Application: 2004/0045931, here fatter Hill), further in view of Mark Lelental et al (U. S. Patent: 7033713, here after 713).

Claim 10 is rejected. 385 and Hill teach the limitation of claim 1 as discussed above. They do not specifically teach the functional material is applied in a curtain coating process. 713 teaches a method of forming conductive features on a substrate) [column 4 lines 26-32]] and he further teaches the conductive features (particles) applied to the substrate by curtain coating method [column 15 lines 50-58]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to produce a structure that 385 teaches where the functional material is applied by curtain coating as 713 teaches, because 713 teaches it is suitable to apply the functional material to a substrate by curtain coating method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TABASSOM TADAYYON ESLAMI whose telephone number is (571)270-1885. The examiner can normally be reached on 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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